

WHELPLEY (H.M.)

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TRICHINA SPIRALIS.

A PAPER READ AT THE ANNUAL MEETING

OF THE

Missouri State Pharmaceutical Association,

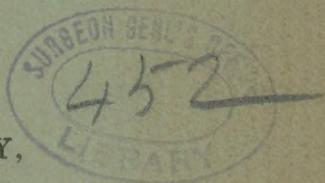
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BY

DR. H. M. WHELPLEY,

ST. LOUIS.



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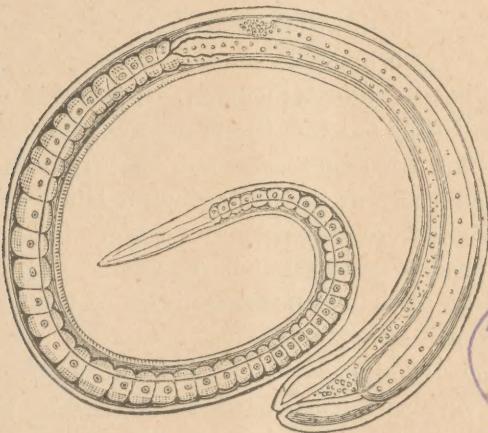
BY

DR. H. M. WHELPLEY, PH. G., F. R. M. S.

Professor of Physiology and Histology and Director of the Histological Laboratory
of the Missouri Medical College; Professor of Microscopy in the St. Louis
College of Pharmacy; Editor of the *Meyer Brothers Druggist*, etc.

The *trichina spiralis* is one of the most interesting of the entozoa (animals living within another). It is classified among the nematoid (thread like) helminths (worms), and derives its name from a resemblance to a spirally twisted hair.

DESCRIPTION.—The individual worm as found in the flesh of animals is asexual and varies in size from 348 to 1270 micromillimetres (1.73 to 1.20 inch) long by 26 to 40 micromillimetres (1.960 to 1.640 inch) thick.



A Trichina magnified 280 diameters.



Trichinæ have been found in human beings, hogs, cats, dogs, rats, mice, badgers, hedgehogs, eels, moles and chickens. It is reasonable to suppose that they may occur in any carniv-

orous animals. After the animal has been infected with the parasite for a time varying from a few months to one or two years, the helminths become encapsulated with a hard calcareous lemon shaped cyst. This is probably a conservative act of nature to protect the muscle from the foreign body and the trichina remains passive in the process of encysting. Some authorities state that the cysts from human flesh can be distinguished from those found in hogs^s on account of having a nodule at each end of the capsule, but I have been unable to verify the statement. The worms may be present in flesh to the extent of over two hundred thousand to the cubic inch. During the stage of existence just mentioned the trichinæ are in a condition to live as long as their host retains vitality. After the death of the animal forming their home, the little fellows will survive many trials of hardships. Maceration in water does not affect them, even when continued for weeks. They have been known to survive a temperature of 165° F. and at 25 degrees below zero became quite active (probably in an endeavor to keep warm). The smoking or salting of the flesh does not insure their death.

DISCOVERY.—Authorities conflict in their statements regarding the discovery of trichinæ. It is probable that Professor Owen of England was the first to examine and describe the worm. The specimen was sent him from the dissecting or post-mortem room of St. Bartholomew Hospital, where the dissecting knives were dulled by the cysts. This was in 1834 or '35. It is also asserted that the ancients knew the parasite and some hint that Moses was aware of their existence in the pork of that day.

TRICHINOSIS, trichiniasis, trichinatous disease and trichinal disease are various terms used to designate the affliction caused by one animal eating the flesh of another containing trichinæ. The disease was first described by Professor Zenker of Dresden in 1860. As soon as a person has eaten of flesh containing the parasites the digestive process sets them free in the stomach from whence they pass to the small in-

testine. Here they become sexual within forty-eight hours, the female becoming slightly larger than the male. Within five or six days the females give birth to living young at the rate of one thousand to each female.

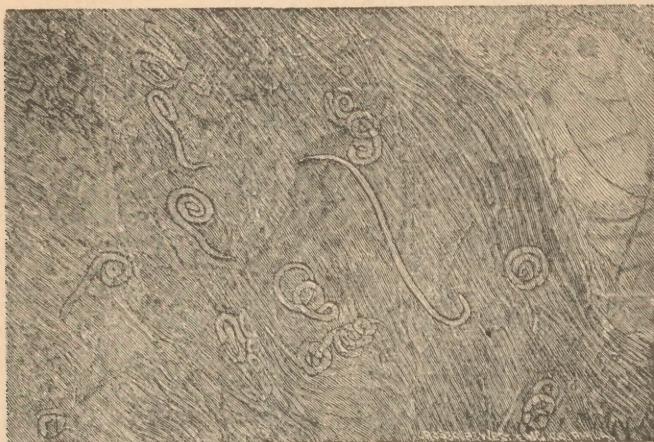


Specimen taken from the deltoid muscle of a thirteen year old girl who died from trichinosis.

By this process a person who has eaten one half pound of infected pork may become the unwilling host of thirty million small filamentous embryo within a few days. The animal causes intestinal disturbances which manifest themselves as abdominal pains, vomiting and diarrhoea. The growing young trichinae soon find their way into tissues and traverse the muscles to their tendonous terminations. The patient usually has an elevation of temperature at this time and it is not controlled by quinine.

Owing to the peculiar fibrous formation of the heart the trichinae never enter its substance and they are seldom found in any of the muscular organs. After the trichinae have traveled as far as they can in the muscles they curl up and remain quiescent until the flesh is disturbed by the death of the host. Pains similar to rheumatism may trouble the patient the

rest of his life. One attack of the disease does not render the victim proof against further invasions and successive attacks may prove fatal when the first is outlived.



Another specimen from the same case. Length of the Trichina stretched, 1-30 inch, thickness 1-700 inch. Magnified 38 diameters.

TREATMENT is not very satisfactory to either physician or patient. If the case is diagnosed in time active cathartics and



Specimen taken from pork which caused the death of a girl and her mother.

emetics will remove the young from the intestinal canal and lessen the dangers. Carbolic acid, benzin and other volatile liquids have been proposed and used, but without beneficial effect. Picric acid has been given until the patient was colored yellow but the trichinæ did not mind it. This is certainly a case where an ounce of preventative is worth a pound of cure and the best treatment is to make a microscopical examination of the meat before eating it or else cook it thoroughly.

EXAMINATION OF MEAT.—The examination of flesh for trichinae is by no means difficult. The trained eye can distinguish the cysts without the aid of a microscope. A lense with a power of ten diameters will show them plainly. When the trichinæ are free it requires a power of about forty diameters to make them out well. To study the animal necessitates much higher powers. A few fibers of the flesh can be picked out and squeezed between two glass slips and then examined in this condition. A few drops of glycerin will facilitate the work. I have never found it necessary to stain the specimen or treat it with ether to extract the fats as some recommend. I make it a rule to keep specimens in glycerin and see that the use of alcohol is avoided.

The diaphragm is as likely to be infected as any portion of the animal and is a convenient muscle to examine.

The statement has been made that one out of every seven human beings are affected with trichinosis. At one time I examined twenty cadavers from a dissecting room and found trichinæ in but one subject.

The above facts have been brought together on this occasion for the purpose of stimulating the pharmacists to prepare for the examination of pork.

The illustrations are from specimens prepared by Dr. Eugene A. Rau, of Bethlehem, Pa.

Mr. Willett asked: "What food will produce trichinæ in rats?"

Dr. Whelpley explained that trichinæ are transferred from

one animal to another by cats devouring mice and rats, or *vice versa* mice and rats devouring cats or hogs.

Mr. Spilker asked in what section of St. Louis the rats on which the doctor reported in his paper had been obtained.

The reply was a 25 lot was obtained in the northern section and an 8 lot was obtained in the neighborhood of Morgan street.

Mr. Giesick inquired how it happened that in a family sick from trichinæ, two or three would die and the balance get well.

Dr. Whelpley replied for the same reason that two or three children in a family sometimes die from whooping cough and the balance get well.

The paper was then referred for publication.

